

ABSTRACT

Inductively-coupled plasma reactors for anisotropic and isotropic etching of a substrate, as well as chemical vapor deposition of a material onto a substrate. The reactor system comprises a processing chamber with a plasma shaping member contained therein. In one embodiment, the plasma shaping member extends from a portion of the top wall of the processing chamber, downward into the chamber, and it is generally positioned above the center of the substrate. The shaping member may be a separate piece of hardware attached to the top wall of the chamber, or it may be an integral part the wall itself. Preferably, the plasma shaping member has a recessed portion in the middle and an extended portion located at a distance outside that of the recessed region. The plasma shaping member may be fabricated from virtually any material since it is at an electrically floating potential during processing of the substrate. The plasma shaping member serves to reduce the ion density in the middle of the chamber, above the center of the substrate, thereby enhancing the uniformity of the plasma throughout the chamber. The enhanced plasma uniformity in turn results in more uniform processing rates of a substrate.